



FRED DUNCAN

POTASSIUM

Element Symbol: **K**

Atomic Number: **19**

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Potassium was discovered by British Chemist, Sir Humphrey Davy (1778 – 1829) in 1807 and received its chemical symbol, “K”, from the Latin word meaning alkali, “kalium”.

The name “Potassium” comes from the word “potash”, as potassium was first isolated from potash (the water-soluble fraction of wood ash) and was the first alkali metal to be isolated by electrolysis. Elemental potassium is a soft silvery-white metallic substance which is abundantly found in seawater in ancient lakes and seas, such as the Dead Sea. Potassium in nature occurs only as ionic salt. More than 2% of the Earth’s weight is made up Potassium and subsequently, it is the seventh most abundant element found. The most stable form of potassium is created in supernovae through a process called Supernova nucleosynthesis.

Potassium is a highly reactive substance with air and water. It oxidizes rapidly in air and will ignite at room temperature. Like other alkali metals; potassium also reacts violently with water, producing hydrogen. The reaction is notably more violent than that of lithium or sodium. Burning potassium floats in water, exposing it to more atmospheric oxygen thus further fuelling the violent reaction. Many common fire extinguishing agents including water are ineffective or make a potassium fires worse. Potassium and its compounds emit a lilac coloured flame.

Potassium is fundamentally involved in a massive amount of body processes, such as nerve conduction, energy production, and muscle contraction, synthesis of nucleic acids and control of heartbeat. In many of its roles, potassium is opposed by sodium, and the two positive ions are jointly balanced by the negative ion, chloride.

Most importantly, Potassium ions are vital to nerve cell function. The cells employ potassium to generate electrical potentials and consequently, creating the vital synapses in the brain and body. Potassium depletion in animals, including humans, results in various neurological dysfunctions.

Some of these dysfunctions include mutations to the Sodium-Potassium Pumps. One type of pump mutation can lead to migraines, hemiplegia and possibly epileptic seizures. Other Sodium-Potassium pump mutations can lead to “rapid-onset dystonia parkinsonism”. This neurological dysfunction is characterised by severe symptoms such as a lack of muscle control, swallowing and speech difficulties.

Potassium is obtained through the diet. One of the most notable high potassium foods is the Banana. Bananas are grown extensively in Australia with the bulk of produce coming out of Queensland. World-wide bananas are one of the most important food sources, particularly in developing countries.

Potassium is a very important element, used extensively in industry. Common product made using potassium include: explosives, agrichemicals, glass, plastics, enamels, inks and dyes.

Imagine Life without Potassium!

Provided by the element sponsor Kathi Marshall

ARTISTS DESCRIPTION

Potassium was first isolated from potash (the water-soluble fraction of wood ash). It is an alkali metal which occurs in nature as an ionic salt. It is an important plant mineral. My print shows a beautiful Eucalyptus pulchella tree, growing on my property near Hobart, which is about to be engulfed by a bushfire- a natural process in Tasmania’s dry forests. This tree has survived many fires, and will survive this one too, but will contribute nutrients, in the form of ash, to other parts of the ecosystem. The lower part of the print reflects the texture and colour of cloth produced by the Hausa people of ancient Nigeria- who mixed indigo dye and potassium to produce a deep blue textile. It also represents the oceans, ancient lakes and seabeds which are a major source of the element and includes a representation of potassium’s atomic structure. The printmaking technique is a dry-point engraving on an acetate plate.

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